STATEMENT OF BASIS

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I. Description of Facility

The applicant operates a tuna cannery located on Tutuila Island, American Samoa. Process discharges from the cannery enter Pago Pago Harbor at 14 deg. 17 min. 01 sec. South latitude and 170 deg. 40 min. 02 sec. West longitude. The cannery receives whole tuna which is processed into canned tuna and dried fish meal. Waste streams from this operation consist mainly of fish waste, fresh water, and sea water which are treated by Dissolved Air Floatation process. The DAF sludge and the high strength waste (pre-cooker condensate, press juice, fish meal plant wash water, etc.) are barged to sea for disposal. Approximately 320 tons of fish are processed per day. The resulting discharge to Pago Pago Harbor has been a maximum monthly average of 0.58 MGD and a long-term average of 0.49 MGD.

Section 24.0206 (c)(2) of the American Samoa water quality standards states that "Pago Pago Harbor has been designated by the American Samoa Government to be developed into a transhipment center for the South Pacific. Recognizing its unique position as an embayment where water quality has been degraded from the natural condition, the EQC has established a separate set of standards for Pago Pago Harbor." A trienniel review of American Samoa water quality standards was begun in 1987 and the results of that review were adopted in 1990. Section 24.0207 (c) specifies the standards that apply specifically to Pago Pago Harbor.

Administrative orders were issued by EPA in June 1990 to both Star-Kist Samoa and Samoa Packing Company for violations of water quality-based effluent limits of their respective 1987 NPDES permits. The orders established interim effluent limits and a schedule for compliance with water quality-based effluent limits by March 7, 1992. Concurrently, the American Samoa Government (ASG) also issued consent decrees mirroring EPA's compliance orders, with stipulated penalties for failure to meet interim effluent limits and compliance schedule deadlines.

Both canneries were required by the orders and consent decrees to segregate high strength waste streams and dispose of these wastes and DAF sludge at a designated ocean disposal site beginning in August 1990. Feasibilility studies were also required to be conducted by both canneries for alternatives by which they could achieve compliance with their NPDES permit effluent limits and ASG water quality standards for their remaining discharge into the harbor. The canneries chose to construct a 7,000-foot joint outfall which extends into the outer harbor. The new outfall will be jointly operated by both canneries for discharge of their effluent.

The two canneries also applied for a mixing zone consistent with the requirements set forth in Section 24.0208 of the American Samoa Water Quality Standards. The mixing zone requested extends approximately 1300 feet in radius from the discharge point. The mixing zone was approved by American Samoa Environmental Quality Commission (ASEQC) on November 27, 1991.

Discharge in compliance with this NPDES permit should ensure achievement of all applicable water quality standards. These standards are designed to prevent degradation of water quality. Therefore, compliance with this NPDES permit should prevent any "unreasonable degradation" of the marine environment, and in accordance with section 403(c) of the Clean Water Act, an NPDES permit may be issued.

II. Effluent Limitations

Discharges from fish processing facilities are not subject to any effective EPA effluent limitations guidelines. Therefore, permit requirements were established using best professional judgment and specific water quality standards in order to ensure protection of the beneficial uses of the receiving waters.

A. pH

The Best Practicable Technology (BPT) limit for pH is "within the range of 6.0 to 9.0." However, water quality standards listed under 24.0207 (c)(7) state: "The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally." Because the water quality standards are more stringent, and because the mixing zone application states that "other water quality standards (beside total nitrogen, total phosphorus and temperature) will be met within the zone of mixing (e.g. pH, fecal coliform)..." the more stringent standard will apply as the limit.

B. Temperature

Water quality standards specify a temperature limit of 85°

F which is to apply to water at the edge of the mixing zone. It is the best professional judgement of this permit writer, that the water will cool at least 10° from the point it enters the discharge pipe to the edge of the mixing zone. Furthermore, modeling studies were performed by the canneries' consultant assuming the effluent was 85° F and 90° F with no significant difference in dilution rates. Therefore, the permit limit contains a 90° F monthly average and a 95° F daily maximum.

C. Oil and Grease

40 CFR 408.140 sets the BPT limit for oil and grease at a daily maximum of 2.1 lbs/1000 lbs of seafood processed and a monthly average of 0.84 lbs/1000 lbs of seafood processed. Limits for oil and grease were calculated by multiplying the BPT limits stated above, by the average daily production level of 320 tons seafood processed/day. Thus the daily maximum for oil and grease is set at 1,344 lbs/day and the monthly average at 538 lbs/day.

D. Total Suspended Solids

Limits were set for Total Suspended Solids (TSS) using the same rationale detailed in Section C (Oil and Grease). 40 CFR 408.140 sets the BPT limit for TSS at a daily maximum of 8.3 lbs/1000 lbs of seafood processed and a monthly average of 3.3 lbs/1000 lbs of seafood processed. Limits for TSS were calculated by multiplying the BPT limits stated above, by the average daily production level of 320 tons seafood processed/day. Thus the daily maximum for TSS is set at 5,312 lbs/day and the monthly average at 2,304 lbs/day.

E. Total Nitrogen

The mixing zone analysis performed by the canneries' consultant, CH2MHill, indicates that the mixing zone can assimilate 60,000 lbs. of total nitrogen per month. Assuming a 30-day month, an average of 2,000 lbs. of total nitrogen/day can be discharged between the two canneries. The two canneries have agreed between themselves to each assume a portion of this average. Samoa Packing will assume 800 lbs/day as a monthly average limit for total nitrogen.

The canneries are required to sample twice/week for total nitrogen on production days. Averaging only these samples will yield a number that assumes weekend values are equal to production days. The canneries have claimed that they discharge significantly less nutrients on the weekends. Therefore, should the permittee wish to monitor the effluent on a non-production day(s), the permittee must monitor for the six consecutive days following the non-

production day on which the first sample was taken. The average of all samples taken during that month will determine compliance with the "monthly average". This requirement will ensure that the monitoring is representative of the discharge, and if the canneries are in compliance with their monthly average limits, the mixing zone's capacity of 60,000 lbs/month of total nitrogen will not be exceeded.

Samoa Packing Company's daily maximum limit was 1,595 lbs/day, as set in EPA's Administrative Order of June 18, 1990. StarKist's daily maximum effluent limit for total nitrogen was 2,440 lbs/day as stated in EPA's letter of October 30, 1991, amending its Administrative Order. These limits were initially to be retained in the new permits. However, the canneries expressed a desire to allocate the total of 4,035 lbs/day between themselves. Since the combined number is the same, the canneries were permitted to do so. StarKist agreed to accept a limit of 2,100 lbs/day, and Samoa Packing Company agreed to a limit of 1,935 lbs/day.

The canneries have claimed that total nitrogen and total phosphorus levels in the effluent have no significant correlation to production levels, and their monitoring data supports such a statement (See Appendix B, "Technical Memorandum for Site-Specific Zone of Mixing Determination for Joint Cannery Outfall Project", CH2M Hill, August 26, 1991). Therefore these effluents limits for total nitrogen and total phosphorus do not limit the canneries' production levels.

F. Total Phosphorus

Limits were set for total phosphorus using the same rationale as that detailed in Section E (Total Nitrogen). The total assimilative capacity of the zone of mixing was caculated by CH2MHill to be a monthly average of 400 lbs. of total phosphorus/day. This total was divided between the two canneries and Samoa Packing has agreed to assume a montly average limit of 208 lbs. of total phophorus/day.

The combined total of daily maximum limits set in the Administrative Orders was 580 lbs. of total phosphorus/day and will be retained in the current permits. The canneries agreed to reapportion their share of the total. Samoa Packing will assume a daily maximum of 271 lbs. of total phosphorus/day.

G. Toxicity

Section 24.0208 (b)(5) of the American Samoa water quality standards states, "Those water quality parameters which are subject to zone of mixing are chlorophyll a, light

penetration depth, nutrients, pH, temperature, turbidity, and fecal coliform. Determination of effluent limits for toxic substances must comply with 24.0207 (a) (8)(A)-(E) and 24.0207 (a)(9)..."

Section 24.0207 (a)(8)(A) states, "All effluents containing materials attributable to the activities of man shall be considered harmful and not permissible until acceptable bioassay tests have shown otherwise."

Section 24.0207 (a)(8)(C) states, "The survival of test organisms in discharge waters shall not be less than that for water from the same water body in areas unaffected by sewage, industrial wastes, or other activities of man..."

In its permit application, Samoa Packing reported that "No toxic pollutants or hazardous substances present in discharge from existing outfall 001 or from proposed joint cannery outfall." However, the reported level of ammonia in the effluent as indicated in the permit application greatly exceeds national criteria for acute toxicity in marine waters at a pH above 6.7. The average pH of the outer harbor is 8.5. Also, reported levels of zinc and lead exceed the acute criteria, and mercury, cadmium and chromium exceed chronic criteria. Numerical limitations and/or monitoring requirements have been placed in this permit on all the known toxic constituents of the effluent. However, since the degree of toxicity of the whole effluent remains unknown, a monitoring requirement for toxicity has been included in this permit.

The water quality standards state at Section 24.0207 (a)(8)(C), "As a minimum, compliance with the standard as stated in the previous sentence shall be evaluated with a 96-hour bioassay or short-term method for estimating chronic toxicity."

The permittee is required to conduct a semi-annual 96-hr static renewal acute bioassays on composite effluent samples using the white shrimp, Penaeus vannamei postlarvae. The white shrimp is a warm-water species that is currently being used in acute bioassays performed in labs in Hawaii.

The permittee is also required to conduct a priority pollutant scan yearly in conjunction with the bioassay.

H. Ammonia

The canneries have requested that they be exempt from the acute toxicity requirement within a mixing zone. The ASEQC approved this request. Little technical guidance exists, however, to define a mixing zone in marine waters that prevents lethality to passing organisms. The

technical support document for the canneries' zone of mixing application cites a few alternatives, but none seems appropriate to this situation.

CH2MHill proposed to use an 80:1 dilution. This dilution, according to their modeling, occurs 30 seconds after the effluent leaves the pipe. The area associated with an 80:1 dilution is approximately 12 meters. They claim that such a dilution will ensure no lethality to passing organisms.

EPA National Water Quality Criteria for un-ionized ammonia is 0.233 mg/l for marine waters. This value is the Criterion Maximum Concentration (CMC). Multiplying this 0.233 by 80 yields 18.64 mg/l. Referencing the manual "Tables of the fraction of Ammonia in the Undissociated form... for ph 6 to 9, temperature 0-30°C, TDS 0-300 mg/l and salinity 5-35 g/kg," by H.P. Skarheim of the University of California, Berkeley, College of Engineering, and using a pH value of 8.5, temperature of 29 °C, and salinity 35 g/kg (all characteristics of harbor waters), the un-ionized fraction of ammonia is 14 percent. Therefore the ammonia limit for the canneries is established at 133 mg/l.

I. Metals

Significant initial dilution should ensure no toxicity from metals within the zone of mixing. However, because metal readings in Pago Pago Harbor have historically been high, the canneries shall continue to monitor annually for cadmium, chromium, lead, mercury, and zinc. Under the Pollution Prevention Program, the canneries are also required to conduct a study in order to determine the source of the metals in the effluent and to examine ways of reducing those metals.

J. Total Residual Chlorine (TRC)

Section 24.0207(a)(12) states that total residual chlorine in discharge waters shall not exceed 20 ug/l. Table 3 in the application for a zone of mixing indicates that the canneries are able to meet the TRC standard at the end of the pipe. However, since the effluent has never been tested for TRC in support of such a statement, and since the canneries do chlorinate their process water, there is reasonable potential to believe the effluent may exceed the TRC standard. A limit and monitoring requirement has therefore been included in this permit.

Because the effluent has never been tested, the permit limit of 20 ug/l will not be effective until one year from the effective date of this permit. This will allow the permittee time to modify operations or install

dechlorination facilities if they are unable to meet the current limit.

K. Pago Pago Harbor Monitoring Program

Because the discharge point has been moved to a less degraded portion of the harbor, a monitoring program has been designed to assess the environmental impacts of the canneries' discharge on the entire harbor, and to ensure compliance with the water quality standards. Compliance with water quality standards for chlorophyll a, light penetration depth, and visible floating materials is to be determined throughout the mixing zone (at monitoring stations 8, 8a, 14-18). Compliance with turbidity, dissolved oxygen is to be determined outside the Zone of Initial Dilution (ZID) (at monitoring stations 8, 8a, 15-18). Compliance with the Total Phosphorus and Total Nitrogen and Temperature is to be determined outside the Zone of Mixing (ZOM) (at monitoring stations 15-18). The constituents of the program are as follows:

1. Quantitative Data

Temperature, pH, dissolved oxygen, total suspended solids, light penetration, turbidity, salinity, chlorophyll a, total nitrogen, total phosphorus, and total ammonia are all measured to ensure compliance with numerical limits of the receiving water.

2. Dye or Tracer Studies

Dye or tracer studies should provide useful information for better understanding the fate of the plume, which, according to CH2MHill's modeling, should remain submerged below 60 feet. The plan for conducting these studies and reporting the information shall be submitted by the canneries to the ASEPA and EPA for approval before the studies are performed.

3. Model Verification

The permittee is required to verify the models used to predict the mixing zones using results of the dye studies, effluent monitoring data, and ambient water quality data.

4. Eutrophication Study

Eutrophication of the harbor is of great concern because of the extremely high amounts of nutrients in the effluent. The study proposed shall examine algal-nutrient relationships of the harbor.

5. Sediment Monitoring

Sediment monitoring is conducted to determine the character of the sediments in relation to long-term high nutrient discharge by the canneries in the harbor and if harbor recovery will be affected by resuspension of the nutrients.

6. Coral Reef Survey

A coral reef marks one edge of the mixing zone. Because of its close proximity to the outfall, there may be effects on the local coral community. Possible effects should be analyzed through a survey that utilizes the coral reef survey performed in the 1991 Use Attainability Analysis as baseline data. The survey should be performed once after a year from the effective date of the permit and every two years thereafter. Should the survey reveal significant degradation of the coral community, subsequent analysis may be required in order to determine more accurately the causes of the degradation.

L. Wastewater Treatment System Evaluation

The permittee should be continuously seeking ways to improve the quality of its effluent. In order to foster that search, the permit includes a requirement to hire an independent consultant to examine the plant and provide a report on possible improvements. The permittee is then required to implement those improvements unless it can be shown, to the satisfaction of ASEPA and EPA, that the recommendations are economically infeasible or technically impossible.

The guidance in the permit for conducting this evaluation was derived from a study performed by CH2MHill on Samoa Packing Company's wastewater treatment system in June, 1991.

M. Pollution Prevention Program

Often the most significant way to reduce the amount of pollutants in the effluent is to stop them at the source. In developing a Pollution Prevention Program, the permittee must examine ways to ensure that a minimum amount of pollutants are entering the harbor as well as a minimum amount of wastewater. The pollution prevention program shall also examine ways to reduce the amount of oil illegally dumped in the harbor by tuna vessels. Finally, it shall include an analyses on the high metal concentrations in the effluent to determine the source(s) and ways to reduce current levels.